In the Claims:

Please cancel claims 3, 5-8, 11-22, 24-35, 37-47, 49-59, 61-71, 73-77, 83-84, 88-89 and 92-93, without prejudice to the inclusion of the subject matter contained therein in any later filed continuation or divisional application(s).

1. (Original) A computer implemented process to identify at least one pattern and its distribution in a set of data for the purpose of interpreting the data, the process comprising:

(a) representing a set of data by an original data matrix D residing in a storage device, and;

(b) decomposing the set of data into a set of patterns represented by a matrix F and their distribution represented by a matrix A, wherein the matrix F represents the set of patterns needed to describe the data and the matrix A represents the distribution of the set of patterns within the data matrix D, the decomposing comprising performing a Bayesian-based Monte Carlo calculation using at least the data matrix D to determine the matrices A and F, wherein the matrices A and F reconstruct the data matrix D and are more amenable to analysis than the data matrix D.

2. (Original) A process according to claim 1 further comprising:

(c) determining by Monte Carlo sampling the uncertainties of all values in the elements of matrix F and matrix A.

3. (Canceled)

4. (Original) A process according to claim 1 further comprising:

(c) using a statistical process to determine the number of independent patterns required to reconstruct the original data matrix D within a noise level from the subordinate matrices A and F.

Claims 5-8 (Canceled)

9. (Original) A process according to claim 1 wherein rows of the original data matrix D are NMR recovery curves associated with specific locations within a living organism, rows of matrix F are individual NMR recovery curves associated with different tissue types, and rows of matrix A are amounts of each tissue type at each specific location within the living organism.

10. (Original) A process according to claim 1 wherein rows of the original data matrix D are levels of expression of individual messenger RNA (mRNA) species at specific times, rows of matrix F are patterns of physiologically related mRNA expression, and rows of matrix A are amounts of each expression pattern at each specific point in time.

Claims 11-22 (Canceled)

23. (Original) A process according to claim 1 wherein rows of the original data matrix D are levels of expression of individual messenger RNA (mRNA) species at specific locations within a living organism, rows of matrix F are patterns of physiologically related mRNA expression, and rows of matrix A are amounts of each expression pattern at each specific location in the organism.

Claims 24-35 (Canceled)

36. (Original) A process according to claim 1 wherein rows of the original data matrix D are amounts of individual DNA species in specific individuals, rows of matrix F are patterns of physiologically related DNA species, and rows of matrix A are amounts of each DNA pattern in each individual.

Claims 37-47 (Canceled)

48. (Original) A process according to claim 1 wherein rows of the original data matrix D are amounts of individual DNA species at specific locations in a living organism, rows of matrix F are patterns of physiologically related DNA species, and rows of matrix A are amounts of each DNA pattern at each specific location in the organism.

Claims 49-59 (Canceled)

60. (Original) A process according to claim 1 wherein rows of the original data matrix D are amounts of individual DNA species at different times in a living organism, rows of matrix F are patterns of physiologically related DNA species, and rows of matrix A are amounts of each expression pattern at each specific point in time.

Claims 61-71 (Canceled)

72. (Original) The process according to claim 1 wherein rows of the original data matrix D are measurements of individual samples comprising mixtures of chemical compounds, rows of matrix F are the measurements associated with a single chemical compound, and rows of matrix A are amounts of each chemical compound in each of the individual samples.

Claims 73-77 (Canceled)

78. (Original) The process according to claim 1 wherein at least one pattern is an amount of goods or services.

79. (Original) The process according to claim 1, wherein the rows of the data matrix D are amounts of goods and services at various times, the rows of matrix F are the patterns of goods and services, and the rows of matrix A are a measure of how the amounts of goods and services are distributed over time.

80. (Original) The process according to claim 1, wherein the rows of the data matrix D are amounts of goods and services at various locations, the rows of matrix F are the patterns of goods and services, and the rows of matrix A are a measure of how the amounts of goods and services are distributed over various locations.

81. (Original) The process according to claim 1 wherein at least one pattern is a monetary value.

82. (Original) The process according to claim 1 wherein the pattern distribution is across entities.

Claims 83-84 (Canceled)

85. (Original) The process according to claim 1 wherein representing a set of data by an original data matrix D involves counting a number of occurrences of events within the set of data and encoding the number of occurrences into the original data matrix D.

86. (Original) The process according to claim 1 wherein the original data matrix D is a set of spatially dependent functions, matrix F is a fixed set of spatially dependent functions, and matrix A is a distribution of the fixed spatially dependent functions within the data matrix D.

87. (Original) The process according to claim 1 wherein the original data matrix D is a series of images, matrix F is a set of unvarying images and A is a measure of how the images in matrix F are distributed in data matrix D.

Claims 88-89 (Canceled)

90. (Original) The process according to claim 1 wherein the data matrix D

is a set of measurements representing behavioral studies.

91. (Original) The process according to claim 1 wherein the data matrix D is a set of measurements representing clinical studies.

Claims 92-93 (Canceled)